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# CYCLOTRON RADIATION



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A reader recently sent me to study cyclotron radiation for other purposes, but instead I found some information to my own purpose. You can find this information on the short page at Wikipedia, where it says,

Furthermore, the period of the orbit is independent of the energy of the particles, allowing the cyclotron to operate at a set frequency.

My brain almost literally tripped over that one sentence. Maybe I am not the first to notice, but that is very curious. It means that the field drives all particles the same speed in the loop. That is analogous to gravity, which curiously ignores the mass of planets when creating orbits and orbital speeds. That is because all things fall at the same rate in a vacuum, remember; and since the centripetal acceleration is equal for unequal masses, they orbit at the same speed at the same orbital distance, by the old equation  $a = v^2/r$ . No mass in that equation.

But in the cyclotron, this fact is even curiuser, since the particles are in a magnetic field, not a gravitational field. Why is the E/M field ignoring mass and energy here? According to current theory, it shouldn't be able to ignore them. This is because the cause of the field isn't the same as with gravity. In the cyclotron, there is no centripetal acceleration and no tangential velocity, as in Newton's explanation. Nor is the curve a Relativity curve, since Relativity curves are caused by gravity. Wikipedia tries to shunt you off into Lorentz forces, but Relativity is only a small part of the E/M field in QED: it isn't the cause of the main motions. In other words, the magnetic field isn't *caused* by Relativity. Yes, we have to do transforms, but that is only to fine-tune the E/M field equations. The E/M field equations aren't caused by Relativity. Therefore the motions and curves aren't caused by Relativity. If they were, they would be gravitational. Einstein's field equations and GR are gravitational field equations, and they are not thought to include E/M. Physicists cannot forbid you from including E/M in the field equations in celestial mechanics and then turn around and explain magnetism by Relativity.

What all this means is that the particles in a cyclotron are not thought to be circling for gravitational or Relativistic reasons. They are circling for magnetic reasons. They are feeling forces from the magnetic

field, and that field is curving for its own reasons. To see what I mean, let us look only at the tangential motion of the particle in the field. This motion is very fast, and is in no way like the motion of a planet in a gravitational orbit. The tangential motion in the gravitational field was assigned to innate motion by Newton, and when it is still mentioned, it still is. But we can't assign the tangential motion of our cyclotron particle to innate motion. It is E/M motion, not innate motion. Likewise for the curve. There is nothing at the center of the cyclotron to cause the curve, via a centripetal force. The magnetic field curves due to its own nature, not in response to a centripetal pull from a real body. This is admitted.

Therefore, we have a real problem here. The magnetic field is normally given a field strength at each position in the field, and if that is so, then each position in the field should also have a real energy. We normally call it potential, but it is an energy vector or tensor at that position. And if that is so, then that energy should interact with the energy of a particle in a defined way. The energy of the particle *should* matter, according to all the current rules of physics. Again, why doesn't it?

It can only be because the energy of the particle is itself determined by the field it is in. In other words, it is variable. Each particle matches itself to the speed of the field, in the same way that all boats float at the same speed in a stream.

You will say, how can that work? It works because larger particles intersect a larger cross section of the field. If we let the magnetic field be composed of real photons, a proton will be hit by more photons than an electron. If the number of hits is proportional to the diameter, then all particles will be driven the same speed by the field.

Why is this important? Why have I taken the time to point it out? Because it proves that the E/M field is composed of real particles. Virtual particles and unassigned field potentials don't work this way. Only real particles work this way. It is clear we have induced motion by contact, and there is no contact with virtual particles or field potentials. Field potentials cannot be the mechanical or physical cause of anything, much less motion, since the field potentials themselves must be caused. To be physical, the magnetic field must have a cause of each vector or tensor at each position. Math and arrows and pluses and minuses are not enough.

The same can be said for the curve of the orbit, which must be caused by the spins on the photons in the field. If the photons are not spinning, there is no way to explain sideways deflections in a defined and physical manner. And this spin must be real. All photons must be spinning about a real axis, with a real radius. And if photons have a real radius and a real spin, they must also have a real mass.

I will be told that the current magnetic field can explain the equal periods in the same way I do, by summing a cross section of field potentials. But it can't, because

The electron has no known substructure. Hence, it is defined or assumed to be a point particle with a point charge and no spatial extent. [Wiki]

It would be difficult to sum a cross section of a point particle. The standard model has stopped talking about the radii of particles expressly to prevent you from analyzing the things I am analyzing. They would prefer it not come up. Because if it does come up, as here, their own accelerator data becomes proof not only of the real radius of the photon, it becomes proof of the real radius of the electron. The electron is clearly NOT a point particle, since its size clearly matters to the magnetic field. To drive the electron the same speed as larger ions, fewer photons must hit it. If fewer photons hit it, it must be

smaller, *but not infinitely small*. If the field force is a function of size, then the particles must have real size. They cannot be point particles.

The standard model can't admit these things because admitting it would screw up all their gauge math, which relies heavily on point particle fudges. This is how they renormalize their equations in the first instance. For example, electrons are said to have a point charge and an intrinsic spin. This is because the standard model can't get their equations to work with real extended charges and real spin, so they make everything virtual. But I have just proved once again that this is not acceptable as physics. All the characteristics of quantum particles, including the photon, must be real, which means we must rewrite all the quantum equations, starting over from the beginning. That is what I have been doing. Although most would think this difficult or impossible, it has actually led to a great simplification of both the math and the physics.